



UNITED STATES PATENT AND TRADEMARK OFFICE

ven

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/668,234

09/24/2003

Toshiharu Seko

1035-469

2043

23117

7590

08/28/2006

NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER

ANDUJAR, LEONARDO

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 08/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/668,234	Applicant(s) SEKO, TOSHIHARU	
	Examiner Leonardo Andújar	Art Unit 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06/09/2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-16 is/are pending in the application.
- 4a) Of the above claim(s) 8-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2, 4-7, 15 and 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>06/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Acknowledgment

1. The amendment filed on 06/09/2006 in response to the Office action mailed on 3/13/2006 has been entered. The present Office action is made with all the suggested amendments being fully considered. Accordingly, pending in this Office action are claims 1, 2 and 4-16

Election/Restrictions

2. Applicant's election without traverse of group I (claims 1-7) in the reply filed on 03/18/2005 is acknowledged.

Claim Rejections - 35 USC § 103

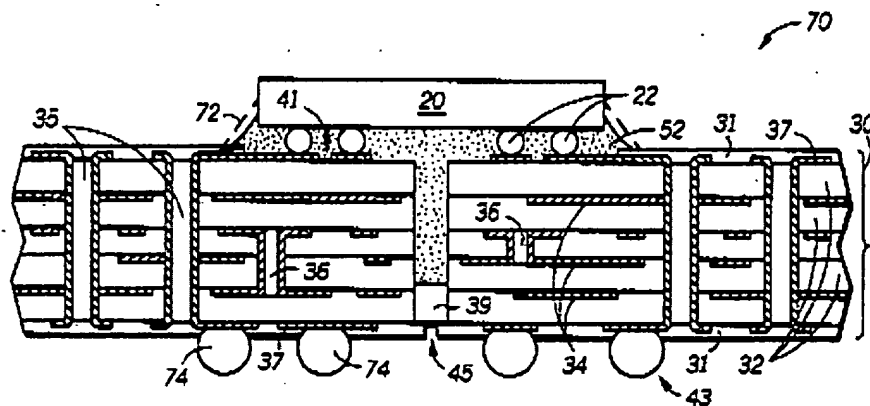
3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2, 4-7, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beddingfield (US 5,710,071) in view of Papathomas et al. (US 5,656,862).

Art Unit: 2826

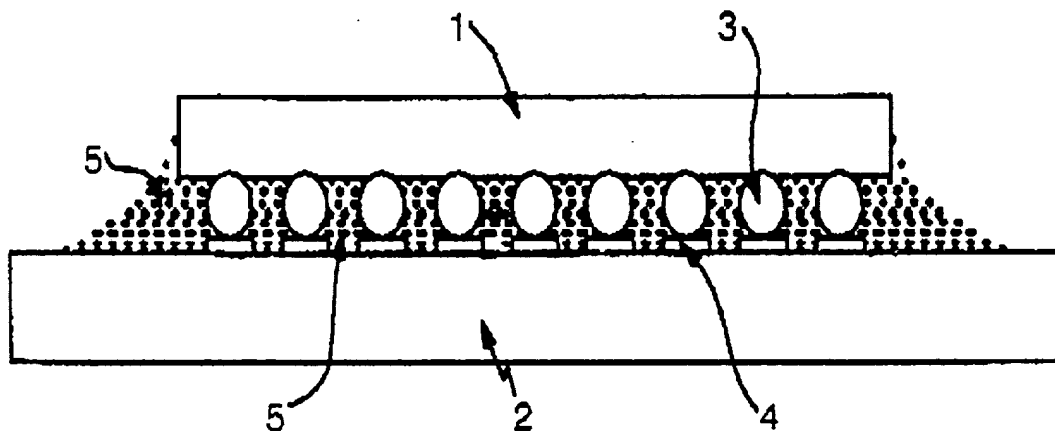
4. Regarding claims 1, 7, 15 and 16, Beddingfield (e.g. fig. 8) shows a semiconductor device 70 comprising: a solder resist 22, an insulating substrate 30 (e.g. bendable tape substrate; col. 1/lls. 10-25 & col. 4/lls. 45-56) having an interconnection pattern 37; a semiconductor element 20, having a projecting electrode 22, electrically connected to the interconnection pattern via the projecting electrode; and a resin fillet 52 for anchoring the semiconductor element on the insulating substrate, the resin fillet being an insulating resin. The solder resist coats or covers part of the interconnection pattern but leaves the interconnection pattern exposed in an area that is to be connected to the semiconductor element via the projection electrode. Also, the insulating resin covers the edge portion of the solder resist wherein the solder resist is laterally offset and spaced laterally outwardly from an outer edge of the semiconductor element when view form above.

**FIG. 8**

Beddingfield does not disclose that the resin contains at least a resin anti-repellent such as a surfactant or that the substrate is a tape that is bendable. Therefore, Beddingfield does not teach that this anti repellent improves/adjusts the wettability of

Art Unit: 2826

the insulating resin for the interconnection pattern and the insulating substrate. Nevertheless, Papathomas (e.g. fig. 1) disclosed a semiconductor device comprising a resin fillet 5 for anchoring a semiconductor element 1 on a substrate 2 that is a bendable tape (e.g. polyimide substrate; claim 22). The resin fillet is an insulating resin containing a resin anti-repellent such as a surfactant (col. 4/lls. 1-18 & col. 14/lls. 31-42). Although Papathomas does not explicitly teach that this anti repellent improves and/or adjusts the wettability of the insulating resin for the interconnection pattern and the insulating substrate this limitation is an inherent property of the material (i.e. Triton X-100). Furthermore, this type of resin fillet enhances the fatigue life of the solder interconnections between the semiconductor device and the supporting substrate (col. 3/lls. 3-41).



It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the resin fillet disclosed by Beddingfield in accordance with Papathomas's invention including a resin anti-repellent such as a surfactant (e.g., Triton X-100) in order to enhance the fatigue life of the solder interconnections between the semiconductor device.

5. Regarding claim 2, Papathomas teaches that the anti repellent is a surfactant such as Triton X-100. Papathomas does not explicitly teach that this anti repellent improves the wettability of the insulating resin for the interconnection pattern and the insulating substrate. Nevertheless, this limitation is an inherent property of the material.

6. Regarding claim 4, Papathomas teaches that the resin anti-repellent is a surfactant. (e.g. Triton X-100; col. 14/lis. 31-42).

7. Regarding claim 5, Papathomas teaches that insulating resin is a light curable resin or a thermosetting resin (e.g. epoxy resin col. 4/lis. 1-18 & col. 9/lis. 31-40)

8. Regarding claim 6, Papathomas teaches that the insulating resin contains conductive particles dispersed in the insulating resin (col. 9/lis. 31-40).

Response to Arguments

9. Applicant's arguments have been considered but are not persuasive. Applicant argues that the substrate disclosed by Beddingfield is non- tape plate or compatible to a tape substrate disclosed by Papathomas. Nevertheless, Beddingfield clearly teaches that his/her invention is compatible a tape automated bonding operation and in one of the embodiment an organic bendable substrate having the same structure of a typical tape is disclosed (col. 1/lis. 10-25 & col. 4/lis. 45-56). Note that a substrate made of a BT resin is in fact bendable. Additionally, Papathomas discloses a bendable tape substrate (e.g. polyimide substrate; claim 22). It is respectfully noted that the cited references alone or in combination suggest a bendable tape substrate can be used.

10. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by

combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the teachings of Papathomas can be incorporated into Beddingfield's invention since this modification will enhance the fatigue life of the solder interconnections between the semiconductor device.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

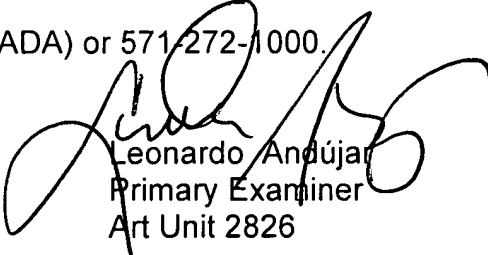
12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonardo Andújar whose telephone number is 571-272-

Art Unit: 2826

1912. The examiner can normally be reached on Mon through Thu from 9:00 AM to 7:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J. Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Leonardo Andújar
Primary Examiner
Art Unit 2826

08/18/2006